ABSTRACT OF THE DISCLOSURE

A method and apparatus for determining the best fit of a population mixture model to data. In the digital imaging area, the use of histogram data is employed. A plurality of sub-population functions are defined and then optimized to fit the data. An objective function is employed, which is based upon the parameters of the underlying functions. The number of underlying functions is added to the parameter mix, such that no *a priori* knowledge of the number of sub-populations is required. In an illustrative embodiment, a genetic algorithm is used to evolve the objective function to an optimal fit of the data. Once an optimal fit is found, through comparison with stopping criteria in a fitness function, the data is segmented according to threshold determined based of classification error in the data.